

MOBILE TERMINAL AND METHOD FOR CONTROLLING THE SAME

CROSS-REFERENCE TO RELATED APPLICATION

[0001] Pursuant to 35 U.S.C. §119(e), this application claims the benefit of U.S. Provisional Application No. 62/220,197, filed on Sep. 17, 2015, and pursuant to 35 U.S.C. §119(a), this application also claims the benefit of earlier filing date and right of priority to Korean Application No. 10-2015-0154728, filed on Nov. 4, 2015, the contents of which are all hereby incorporated by reference herein in their entirety.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a mobile terminal, and more particularly, to a watch-type mobile terminal capable of being controlled based on a sensed pressure.

[0004] 2. Background of the Invention

[0005] Terminals may be generally classified as mobile/portable terminals or stationary terminals according to their mobility. Mobile terminals may also be classified as hand-held terminals or vehicle mounted terminals according to whether or not a user can directly carry the terminal.

[0006] Mobile terminals have become increasingly more functional. Examples of such functions include data and voice communications, capturing images and video via a camera, recording audio, playing music files via a speaker system, and displaying images and video on a display. Some mobile terminals include additional functionality which supports game playing, while other terminals are configured as multimedia players. More recently, mobile terminals have been configured to receive broadcast and multicast signals which permit viewing of content such as videos and television programs.

[0007] Various attempts have been made to implement complicated functions in such a multimedia device by means of hardware or software.

[0008] As the mobile terminal becomes multifunctional, various methods for controlling the mobile terminal are being researched. However, it is difficult to control various functions of a watch-type mobile terminal having a narrow display region on which a user's touch input is received.

[0009] Further, in case of mounting an additional sensor for setting various control commands, the thickness and the weight of the mobile terminal are increased.

SUMMARY OF THE INVENTION

[0010] Therefore, an aspect of the detailed description is to provide a mobile terminal capable of being controlled based on a pressure applied to control various functions more conveniently.

[0011] To achieve these and other advantages and in accordance with the purpose of this specification, as embodied and broadly described herein, there is provided a watch-type mobile terminal, including: a terminal body; a sensor unit disposed on one surface of the terminal body, configured to determine whether the watch-type mobile terminal has been worn or not, and including a light emitting portion for emitting light of a first intensity at first time intervals, and a light receiving portion for sensing reflected light; and a controller configured to control the light emitting portion to

emit light of a second intensity at second time intervals between the first time intervals, wherein the controller calculates a pressure value applied to the terminal body based on an optical amount of light incident onto the light receiving portion, and generates a specific control command based on the pressure value.

[0012] In an embodiment of the present invention, the controller may control the second intensity and the light of the second intensity, based on information about a user's skin color. Thus, a pressure value may be calculated more precisely according to an optical amount suitable for each user having an own skin color.

[0013] In an embodiment of the present invention, the controller may generate the control command based on an applied specific type of touch input, if it is determined that the watch-type mobile terminal has not been worn. Thus, even if the watch-type mobile terminal is in a non-worn state, a user may execute a desired function.

[0014] The present invention may have the following advantages.

[0015] Firstly, since the same sensor is used to sense whether the watch-type mobile terminal has been worn and to generate a control command based on a pressure change, an additional component for executing a different function is not required. As the watch-type mobile terminal has a minimized number of components, the thickness of the watch-type mobile terminal may be reduced.

[0016] Secondly, since an intensity and an output time of light are determined based on a user's skin color, a pressure value may be precisely measured based on an amount of received light even when a user has a different skin color.

[0017] Further scope of applicability of the present application will become more apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate exemplary embodiments and together with the description serve to explain the principles of the invention.

[0019] In the drawings:

[0020] FIG. 1 is a block diagram of a watch-type mobile terminal according to the present invention;

[0021] FIG. 2 is a conceptual view of a watch-type mobile terminal of the present invention, which is viewed from one direction;

[0022] FIG. 3 is a conceptual view illustrating a control method of a watch-type mobile terminal according to an embodiment of the present invention;

[0023] FIGS. 4A to 4E are conceptual views illustrating a control principle of the watch-type mobile terminal shown in FIG. 3;

[0024] FIG. 5A is a conceptual view illustrating a method of controlling a light emitting amount based on a skin color, according to an embodiment of the present invention;